

A TAXONOMIC STUDY OF *HEMIGYMNASPIS* (LINDINGER)
(HOMOPTERA: DIASPIDIDAE) INCLUDING DESCRIPTIONS
OF FOUR NEW SPECIES¹

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Abstract.—A generic diagnosis of *Hemigymnaspis* is given and four new species are described and illustrated; they are *Hemigymnaspis brayi* from Dominica, *H. jessopae* from southern Florida, *H. orchidicola* from Venezuela, and *H. pimentae* from the Dominican Republic. A key is given for the five species.

In 1972, Davidson redescribed *Hemigymnaspis* and gave a detailed treatment of the only included species *H. eugeniae* (Lindinger). Since that time, four additional species have been discovered and are here described.

Methods and Depositories

Terminologies used in the descriptions of the adult male and first instar are that of Ghauri (1962) and Stuetzel and Davidson (1974) respectively. Terminology regarding sclerotized areas on the pygidium of the adult female is that of Davidson (1970).

In the descriptions, total numbers of structures are given for half of the body as they appear on the illustrations unless indicated otherwise. For example, on *H. eugeniae* there is an average of 60 pygidial macroducts on each specimen; in the description we state that there are about 30. Numerical values are based on 10 specimens and are given as a range followed by an average (rounded off to the nearest whole number) in parentheses.

Depositories and their abbreviations are as follows: British Museum (Natural History), London (BM); California State Department of Agriculture, Sacramento (CDA); Florida State Collection of Arthropods, Gainesville (FSCA); Museo de Historia Natural de la Ciudad de Mexico, Mexico City (MNC); Museum National d'Histoire Naturelle, Paris (MNH); South African National Collection of Insects, Pretoria (SA); University of California, Davis (UCD); University of Delaware, Newark (UD); University of Hawaii at Manoa, Honolulu (UH); United States National Museum of Natural History, Washington, D.C. (USNM); Virginia Polytechnic Institute and State University, Blacksburg (VPI); Zoological Academy of Science of USSR, Leningrad (ZAS).

Genus *Hemigymnaspis* Lindinger, 1934

Hemigymnaspis Lindinger, 1934:45 (as a subgenus of *Melanaspis* Cockrell).

Type-species, *Melanaspis* (*Hemigymnaspis*) *eugeniae* Lindinger, 1934 by original designation and monotypy.

Adult Female

Diagnosis.—Pygidium usually retracted into prosoma at maturity; 4–6 lobes, lobes 1–2 longer than wide, lobes 3–6 normally wider than long; 2 setae located over lobe 1; normally 4 sclerotized areas on each side of body; submedial setae on each abdominal segment; perivulvar pores scattered around vulva, normally not forming distinct groups. Prosoma sclerotized anteriorly on mature females; gland spines or gland tubercles lateral; antenna with 2–4 conspicuous setae; paraspircular areas frequently lightly sclerotized, without pores.

Notes.—The adult female of *Hemigymnaspis* has features atypical of most members of the tribe Aspidiotini, i.e.,—dorsosubmedial setae on each abdominal segment, gland tubercles or gland spines, and more than one conspicuous seta on antenna.

Hemigymnaspis resembles *Furcaspis* Lindinger. Besides sharing the above atypical Aspidiotini features, these genera also share other unusual features, i.e.,—4 sclerotized areas on each side of the pygidium, 2 dorsal setae over the center of lobe 1, at least 4 pairs of lobes, and perivulvar pores scattered around vulva. *Furcaspis* has the interlobular plates furcate, the anterior paraspircular area with pores, the 3rd lobes are longer than wide, and the interlobular space between lobes 3 and 4 at least twice as long as the width of lobe 3. *Hemigymnaspis* differs by having the plates of various shapes, not furcate, the paraspircular areas without pores, the 3rd lobe normally longer than wide, and the interlobular space between lobes 3 and 4 about equal to the width of lobe 3.

Adult Male

Diagnosis.—Dorsosubmarginal setae on each abdominal segment; lateral area of abdominal segment 8 produced into lobe; pronotal ridges fused medially; ocelli absent; postocular and preoral ridges fused, without intervening sclerotized plate.

Notes.—The adult male of *Hemigymnaspis* has features atypical of all other members of the Aspidiotini except *Furcaspis*, i.e.,—the occurrence of a complete row of dorsosubmarginal setae on the abdomen and the lack of ocelli.

The diagnostic characters given for the male of *Hemigymnaspis* separate it from all other diaspidids. Based on our examination of the males of *Furcaspis biformis* Cockerell and *F. charmoyi* Brain, *Furcaspis* lacks lobes on segment 8, has medially separate pronotal ridges, and has separate postocular and preoral ridges.

First Instar

Diagnosis.—Pygidium with 2 lobes, medial lobe with basal sclerosis, lateral lobe without sclerosis; dorsosubmarginal setae on each abdominal segment; paraspircular areas without pores; antenna 6-segmented; tibio-tarsal division distinct.

Notes.—The first instar of *Hemigymnaspis* and *Furcaspis* is an unusual member of the Aspidiotini because it has complete rows of dorsosubmedial setae, a 6-segmented antenna, and a distinct tibio-tarsal division. These character states were previously believed to be characteristic of tribes other than the Aspidiotini.

The diagnostic features given for the first instar of *Hemigymnaspis* separate it from all other diaspidids. The first instar of *Furcaspis biformis* has each of these characters except it has a paraspircular pore near each anterior spiracle. *Furcaspis biformis* differs further by having the 2nd lobe with the distal apex forming a large rounded lobule about as wide as the entire lobe, the plates between the medial lobes are simple, and the dorsomarginal setae on the abdomen are as long as the femur. *Hemigymnaspis* as represented by *H. brayi* Davidson and Miller, n. sp. has the 2nd lobe with the distal apex forming a small point that is less than $\frac{1}{3}$ as wide as the entire lobe, each plate between the medial lobes has 6–9 tines, and the dorsomarginal setae on the abdomen are less than $\frac{1}{3}$ as long as the femur.

Key to Species of *Hemigymnaspis* (Adult Females)

1. Each side of pygidium with 5 or 6 lobes and more than 10 macroducts 2
 - Each side of pygidium with 4 lobes and less than 5 macroducts (Florida) *jessopae*, new species
2. Plates serrate, bifurcate, or trifurcate; plates between lobes 4 and 5 approximately as long as each lobe; small sclerotized spot anterior of 2nd sclerotized area 3
 - Plates simple; plates between lobes 4 and 5 less than half length of each lobe; without small sclerotized spot anterior of 2nd sclerotized area (Dominica) *brayi*, new species
3. Less than 40 macroducts on each half of pygidium; marginal areas of head with few microducts 4
 - More than 50 macroducts on each half of pygidium; marginal areas of head with dense row of microducts (Dominican Republic) *pimentae*, new species
4. Space between lobes 2 and 3 with 3 plates; area posterolaterad of spiracle clear, without dermal striations; paraphyses short (Fig. 5) (Venezuela) *orchidicola*, new species

- Space between lobes 2 and 3 with 2 plates; area posterolaterad of spiracle with dermal striations; paraphyses long (Puerto Rico, Virgin Islands) *eugeniae* (Lindinger)

Hemigymnaspis brayi Davidson and Miller, new species

Type-data.—Holotype adult female on slide with 4 other specimens; holotype nearest bottom of slide with left label "Hemigymnaspis brayi Davidson and Miller, On Araceae probably *Anthurium* (?) bark, on trail to Boire Lake from Fresh Water Lake, Dominica, D. F. Bray, Feb. 22, 1964," right label with map of position of holotype on slide and "*Hemigymnaspis brayi* Davidson and Miller HOLOTYPE and PARATYPES" (USNM). There are 101 paratypes with same data on 22 slides; at least 1 slide is deposited in each of the following: BM, CDA, FSCA, MNC, MNH, SA, UCD, UD, UH, USNM, VPI, ZAS.

Field characters.—The female cover is elongate oval, slightly convex, black, with the beige exuviae terminal. The male cover is similar in shape and texture but smaller, flat, light brown, with the yellow-brown exuviae subterminal. The scales were located in bark crevices.

Adult Female

(Fig. 1)

Recognition characters.—Holotype adult female 0.8 mm long (paratypes 0.6–0.8 (0.8)), 0.6 mm wide (paratypes 0.5–0.7 (0.6)); prosomal sclerotization limited to body margin of head and anterior thorax.

Prosomal dorsum with small microducts scattered over submedial areas of thorax and abdomen; larger microducts in irregular band along body margin from anterior part of pygidium to posterior margin of thorax; gland spines absent; 3 cicatrices and sclerotized eye. Prosomal venter with antenna bearing 4 conspicuous setae; paraspircular areas sclerotized, forming plate about 3 times as long as diameter of spiracle; cicatrices absent; microducts of 3 types, marginal ducts largest, with sclerotized dermal orifice, about size as those on margin of dorsum, on anterior abdominal segments and posterior thoracic segments, smaller ducts without sclerotized orifices, present along body margin and in submedial area, absent from head, ducts similar to those in submarginal tubercles; tubercles scattered along body margin, intergrading in form with gland spines.

Pygidium rounded apically. Pygidial dorsum with 4 distinct sclerotized areas, area 2 partially or completely divided near submargin. Macroducts primarily on sclerotized areas, ducts of 1 size, 40 ducts on 1 side of body and 41 on other (paratypes 38–56 (47)); sclerotized spot near apex of 2nd sclerotized area absent; anal opening slightly posterior of pygidial

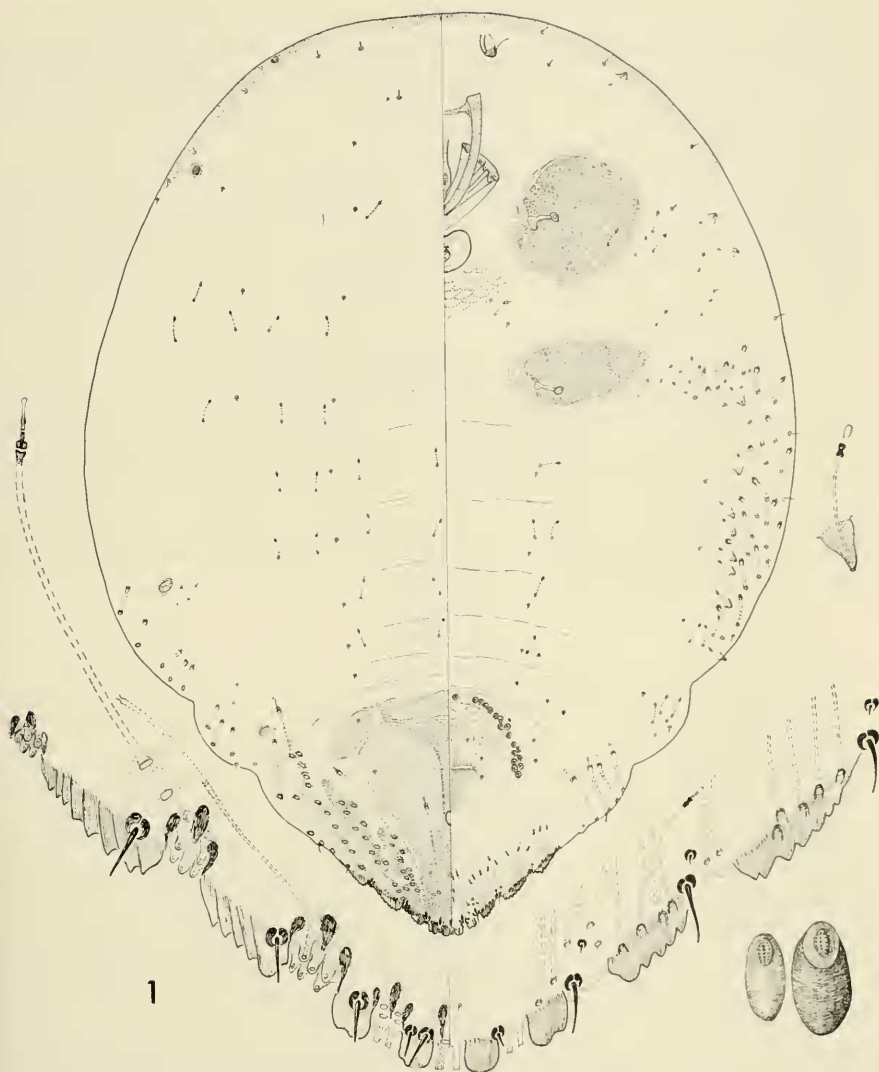


Fig. 1. *Hemigymnaspis brayi*, adult female holotype, dorsal and ventral aspects.

midlength. Pygidium with 5 lobes, medial lobe with trace of lateral notch, lobe 2 with deep lateral notch, lobes 3-5 wider than long, serrate, with dorsal setae on medial side of lobes 3 and 4 and on lateral side of lobe 5, dorsal seta of segment 3 absent. Plates between medial lobes apically expanded, remaining plates indefinite, represented by several small lobules.

each plate with unusually long microduct. Pygidial venter with many microducts near body margin; perivulvar pores scattered around vulva, not organized into groups. Vulva anterior of pygidial midlength. Paraphyses short, 2 between medial lobes, 3 between medial lobe and lobe 2, and 3 between lobes 2 and 3.

Variation.—The paratypes sometimes have the cicatrix nearest the head absent and occasionally they have a cicatrix near the antenna; the paratypes sometimes have a dorsal seta on segment 3 and a completely sclerotized area 2. All adult-female material is newly matured. We believe that older specimens are more heavily sclerotized and the pygidium is partially retracted into the prosoma.

Notes.—The above description is based on 85 specimens.

Hemigymnaspis brayi differs from all other species of the genus by having 3 paraphyses between each of lobes 2 and 3, 3 and 4, and 4 and 5; by having plates small and lobelike, paraspircular areas sclerotized into plates that are about 3 times as long as spiracle diameter, microducts of plates with unusually long inner filaments, and by lacking a small sclerotized spot anterior of sclerotized area 2. These features are unique to *H. brayi* within *Hemigymnaspis*.

Adult Male

(Fig. 2)

Recognition characters.—Allotype, mounted, 0.8 mm long, 0.2 mm wide at mesothorax.

Dorsum with lateral margin of segment 8 produced into lobe with 3 marginal setae. Setae as illustrated, complete longitudinal line of setae on mediolateral areas of abdomen, 3 pairs of setae on prescutum and scutum. Abdominal sclerotization conspicuous, with medial tergitelike structure visible on each segment. Metathorax with elongate postnotum; suspensorial sclerites represented by small sclerotized spot near halteres. Mesothorax with prescutum subtransverse and weakly reticulate; scutum without reticulation; scutellum with indefinite foramen; postnotal triangular area with longitudinal striation. Prothorax with pronotal ridges fused medially; lateral pronotal sclerites and posttergites conspicuous; median pronotal sclerite apparently absent. Head with definite midcranial ridge, lateral arms small; dorsal part of preocular and postocular ridges forming heavily sclerotized plate around dorsal eye; postoccipital ridge lightly sclerotized medially, anterior arms forming triangular plates, posterior arms heavily sclerotized, lightly sclerotized areas behind posterior arms forming noticeable plates. Dorsal eye about 24 μ in diameter. Ocelli absent.

Penial sheath about 262 μ long; greatest width/length about 0.2; anal opening somewhat larger than normal for diaspidid.

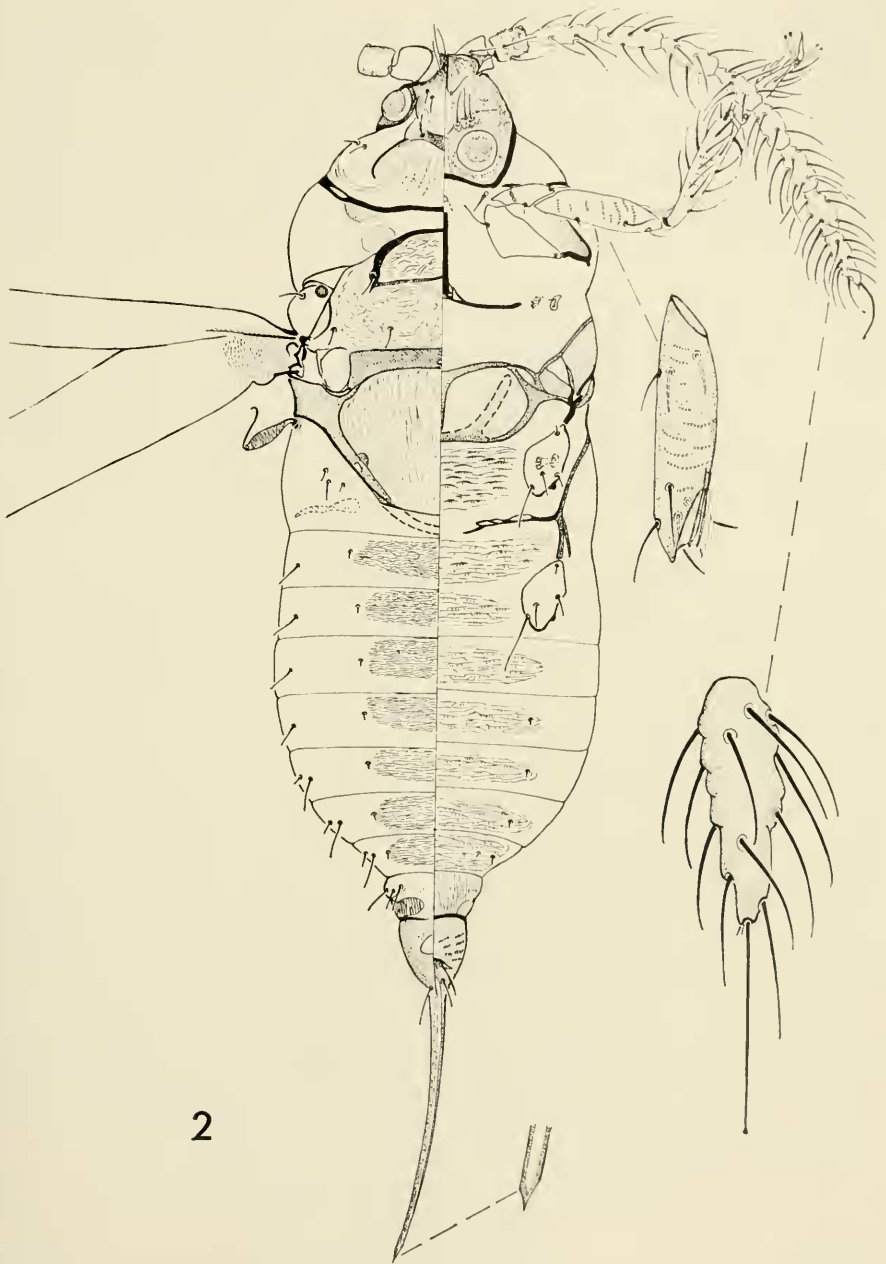


Fig. 2. *Hemigymnaspis brayi*, adult male allotype, dorsal and ventral aspects.

Venter with setae as illustrated, ventral abdominal setae difficult to discern because of condition of specimens. Abdominal sclerotization conspicuous medially. Metathorax without episternum, with noticeable precoxal ridge and basisternum; area anterior of precoxal ridge sclerotized. Mesothorax with basisternum divided by median ridge. Prothorax with sternum well developed, median and lateral arms conspicuous, without triangular plates. Head with midcranial ridge thin; preocular ridge indefinite; postocular ridge well developed, fused with preoral ridge; ventral plates indefinite.

Legs represented by prothoracic pair only, others broken; setae predominantly hairlike, tibia with spur distally, tarsus with several bifurcate setae, claw digitules broken; trochanter apparently with 6 sensilla, tarsus with 1; tibia tarsus 1.3. Antennae about half as long as body length, 10-segmented, third segment about 1.2 times longer than apical segment; antennal setae primarily simple, hairlike on first 3 segments, "sensory pegs" on segments 3 and 10, and porelike sensillum on segment 2.

Notes.—The above description is based on 3 specimens, 2 in exuviae of pupae.

The adult male of this species is unusual by having dorsosubmarginal setae on each abdominal segment, marginal setae on abdominal segment 8 on a lobe, the medial areas of abdominal segments distinctly sclerotized, the pronotal ridges fused medially, a sclerotized plate behind each posterior arm of the postoccipital ridge, the ocelli absent, the postocular ridges fused with the preoral ridges.

The sclerotization of the medial areas of the abdomen associates *Hemigymnaspis brayi* with *Aspidiotus nerii* Bouché, *A. destructor* Signoret, and *A. excisus* (Green); the fused preoral and postocular ridges suggest a relationship to *Parlatoria oleae* (Colvee), *P. morrisoni* McKenzie, and *P. blanchardii* (Targioni-Tozzetti). The occurrence of a medially fused pronotal ridge and a sclerotized plate behind the lateral arms of the postoccipital ridges are features of *H. brayi* unknown in other diaspidid males. The occurrence of a complete series of dorsosubmarginal setae on the abdomen and the lack of lateral ocelli are features characteristic of the Diaspidini not Aspidiotini. With *H. brayi* a member of the latter tribe, this is the first report of these character states in the Aspidiotini. These unusual Aspidiotini states also occur in *Furcaspis biformis* and *F. charmoiji* and are reported here for the first time.

First Instar
(Fig. 3)

Recognition characters.—Mounted, 0.3–0.4 (0.3) mm long, 0.2–0.3 (0.2) mm wide.

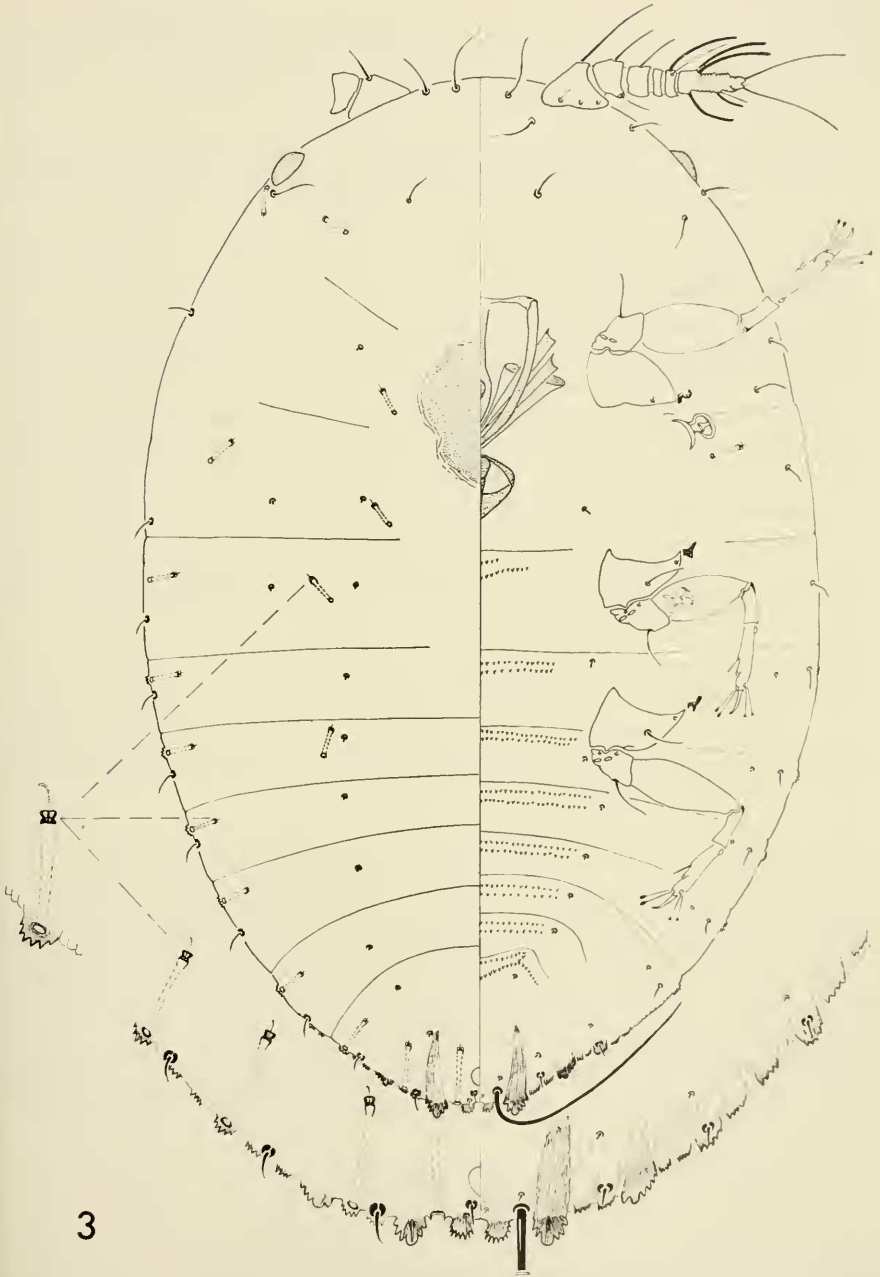


Fig. 3. *Hemigymnaspis brayi*, first instar, dorsal and ventral aspects.

Dorsum with setae and tubular ducts as illustrated; longitudinal line of submedial setae on abdomen typical of Diaspidini, paired setae on meso- and metathorax and distribution of ducts typical of Aspidiotini. Anal ring about diameter of ring away from apex of body. Sclerotized area directly over mouthparts.

Marginal areas with 2 lobes homologous to lobes 2 and 3 on adult female, lobe 2 with basal sclerosis and 2 medial and 3 lateral notches, lobe 3 without sclerosis, with 1 medial and 2-5 lateral notches. Plates between 2nd lobes with 6-9 tines, between lobes 2 and 3 with 3-6 tines; plates anterior to lobe 3 variable in number, normally 3/segment, but on fully expanded crawlers all but plates associated with ducts absent.

Venter with setae and ducts typical of Aspidiotini. Legs with coxae each with setae, 1 on ventral surface and 2 on dorsal surface, trochanter with 2 sensilla on each surface and with 1 large and 2 small setae, femora and tibiae without setae, tarsi each with 1 seta, 2 capitate digitules, and 2 sensilla, tarsal sensillum near juncture of tibia on legs of all specimens, tibia and tarsus separate, tibia/tarsus 0.5-0.7 (0.6); claws each with 2 capitate digitules. Antenna 6-segmented, 52-58 (56) μ long, segments 2-5 each about same length, apical segment about 0.6 times as long as total length of remaining segments. Anterior spiracle without paraspiracular pore.

Notes.—The above description is based on 7 specimens.

The first instar of *H. brayi* is an unusual member of the Aspidiotini because it has a complete row of submedial setae, 6-segmented antenna, and a distinct division between the tibia and tarsus; these are features previously believed to be characteristic of other tribes.

The first instar of *Furcaspis biformis* also has the above characters. *Hemigymnaspis brayi* and *F. biformis* differ by the 2nd lobes of the latter with the distal apex forming a large rounded dome about as wide as lobe, the plates between the lobes simple, the anterior spiracles each with a single paraspiracular pore, dorsomarginal setae on the abdomen as long as the femur, and antennal segments 2-5 each about the same length. *Hemigymnaspis brayi* has the 2nd lobes with the distal apex forming a small point which is less than $\frac{1}{3}$ as wide as the lobe, the plates between the 2nd lobes with 6-9 tines, the anterior spiracle without associated pores, and the dorsomarginal setae on the abdomen less than $\frac{1}{3}$ as long as the femur.

We take great pleasure in naming this species in honor of Dale F. Bray, Department of Entomology and Applied Ecology, University of Delaware, who collected this and many other interesting scale species in Dominica. Dr. Bray collected the material while participating in the Bredin-Archbold-Smithsonian Biological Survey of Dominica.

The host of this species is uncertain. Dr. Bray feels certain that the host

is a member of the Araceae and is fairly well convinced that it is a species of *Anthurium*, but he is not positive.

Hemigymnaspis eugeniae (Lindinger)

This species was redescribed and illustrated in detail by Davidson (1972), therefore we are including here additions only.

Adult Female

Recognition characters.—Prosomal dorsum with 2 or 3 submarginal cicatrices, 1 near eye, rarely 1 on thorax, and 1 near juncture of thorax and abdomen. Prosomal venter with paraspiracular areas sometimes weakly sclerotized into oval plates, these areas slightly longer than length of spiracle diameter. Pygidial dorsum with macroducts primarily restricted to sclerotized areas, ducts of 2 sizes, large size near lobes 1 and 2, with 25–33 (29); small sclerotized spot near apex of each 2nd sclerotized area. Two large dorsal setae on lobe 1. Rarely pygidium with 6th lobe and 2 plates between lobes 5 and 6.

Notes.—*Hemigymnaspis eugeniae* is most similar to *H. orchidicola* Davidson and Miller, n. sp., but differs by having 2 plates between lobes 2 and 3 and fewer gland spines along posterior portion of body margin of prosoma, and by lacking clear areas posterolaterad of each spiracle. *Hemigymnaspis orchidicola* has 3 plates between lobes 2 and 3, more gland spines along posterior portion of body margin of prosoma, and large clear areas posterolaterad of each spiracle. For a comparison of *H. eugeniae* with *H. pimentae* see “Notes” of the latter species.

Hemigymnaspis jessopae Davidson and Miller, new species

Type-data.—Holotype adult female on slide with left label “*Hemigymnaspis jessopae* Davidson and Miller, on *Eugenia simpsonii* A. Sarg., nr. Orchid, Indian River Co., Fla. V-8-'75, D. R. Miller, R. F. Denno, J. A. Davidson #2980,” right label “*Hemigymnaspis jessopae* Davidson and Miller, HOLOTYPE” (USNM). There are 10 paratypes with same data on 3 slides; 1 slide is deposited in the BM, the others are in the USNM.

Field characters.—This species occurs on the bark of the host just above and below the soil surface.

Adult Female

(Fig. 4)

Recognition characters.—Holotype adult female 0.8 mm long (paratypes 0.6–0.7 (0.7)), 0.6 mm wide (paratypes 0.5–0.7 (0.6)); prosomal sclerotization limited to body margin of head, thorax, and anterior abdomen.

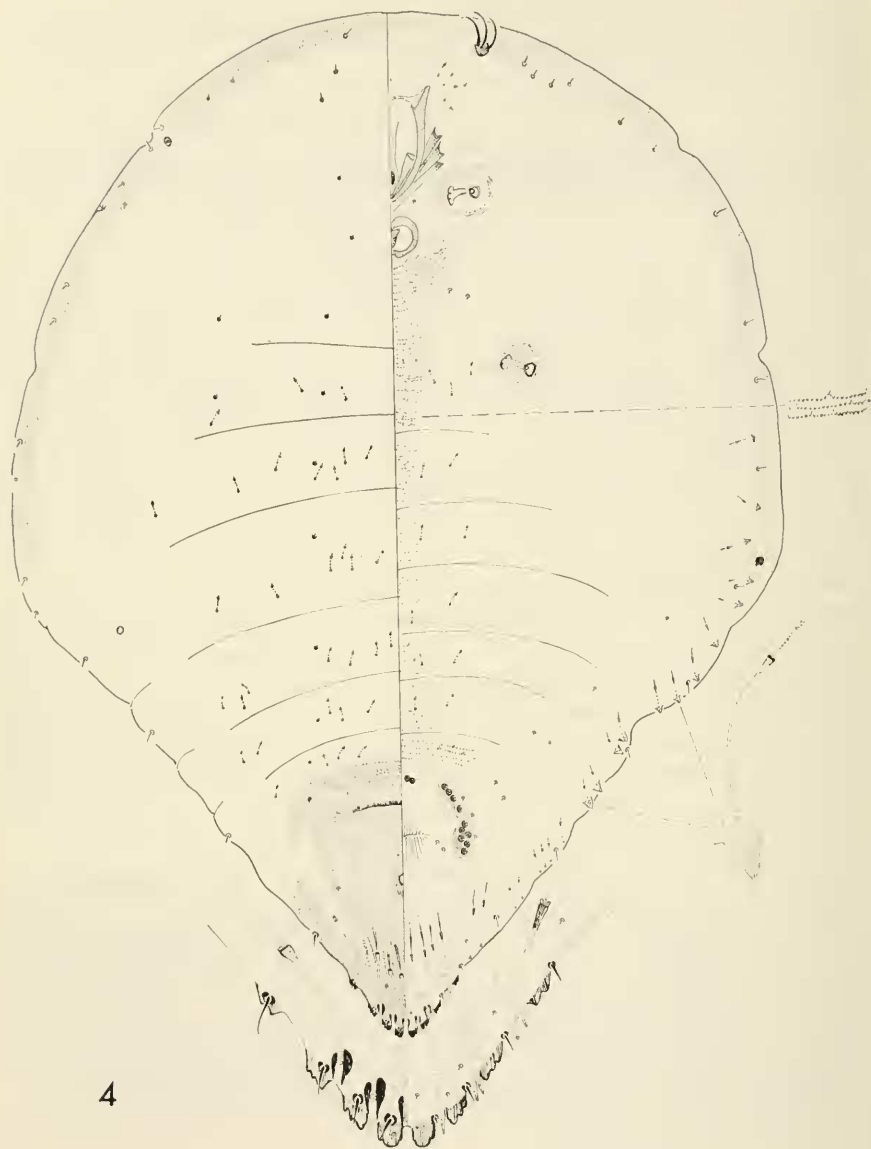


Fig. 4. *Hemigympaspis jessopae*, adult female holotype, dorsal and ventral aspects.

Prosomal dorsum with small microducts in submedial areas of anterior abdominal segments and posterior thorax; larger microducts absent from margin; gland spines absent; cicatrices variable, indefinite, eye apparently absent. Prosomal venter with antenna bearing 3 conspicuous setae; an-

terior paraspiracular areas clear, posterior paraspiracular areas sclerotized, forming plate about equal to length of spiracular diameter; cicatrix on abdominal segment 1; microducts of 2 types, ducts near body margin of abdomen and posterior thorax forming small gland spines or tubercules at dermal orifice, smaller ducts scattered over venter.

Pygidium acute apically. Pygidial dorsum with 4 distinct sclerotized areas, area 2 undivided. Macroducts restricted to sclerotized areas, ducts of 1 size, 2.5 on 1 side of body and 3.5 on other, present between medial lobes, lobes 1 and 2, and 2 and 3, 1 side of body with macroduct near lateral margin of medial sclerotized area just anterior of paraphyses between lobes 2 and 3 (paratypes 2.5–3.5 (2.5) macroducts); small sclerotized spot near apex of 2nd sclerotized area; anal opening slightly anterior of pygidial midlength. Pygidium with 4 lobes, becoming increasingly broad anteriorly; medial lobe with 1 lateral and 1 medial notch, lobe 2 with 2 lateral notches, lobe 3 with 2 lateral notches, lobe 4 with 1 or 2 lateral notches; lobe setae over center of each lobe. Plates between medial lobes absent or broken, space between medial lobe and lobe 2 with 1 plate, spaces between lobes 2 and 3 and 3 and 4 with 2 plates; plates each with 1 slender microduct, these ducts with unusually long inner filament. Pygidial venter with few microducts scattered along body margin anterior of lobe 4, microducts without long inner filaments; perivulvar pores organized into 5 indefinite groups. Vulva anterior of pygidial midlength. Paraphyses moderately long, 2 between medial lobes, and 2 between each of lobes 1 and 2, and lobes 2 and 3.

Variation.—The paratypes frequently have more prepygidial microducts, rarely have an eye, rarely have anterior paraspiracular area sclerotized, may have 2nd sclerotized area with apical portion separate from marginal portion, and may have areas 3 and 4 fused. The plates and lobes are quite variable; lobe 1 may have 1 or 2 lateral notches and 0–1 medial notches, lobe 2 may have 1–3 notches, lobe 3 may have 2–3 notches, and lobe 4 may have 1–4 notches; normally 2 small plates are between medial lobes, 1–2 between medial lobes and 2, 0–2 between lobes 2 and 3, 1–3 between lobes 3 and 4, and 1 plate anterior of lobe 4.

Notes.—The above description is based on 11 specimens.

Hemigymnaspis jessopae differs from all other species of the genus by having less than 5 macroducts on each side of pygidium, 4 lobes, and an apically acute pygidium. These features are unique to *H. jessopae* within *Hemigymnaspis*.

We take great pleasure in naming this species in honor of Dorothy S. Jessop who has made thousands of microscope slides of scale insects. We are grateful for her dedication to the preparation of high quality scale-insect slides which will continue to serve as the basis for much of the Coccoidea taxonomic research in the U.S.

Hemigymnaspis orchidicola Davidson and Miller, new species

Type-data.—Holotype adult female on slide with left label "Hemigymnaspis orchidicola Davidson and Miller, Venezuela, ex orchid leaf, VIII-24-72, Miami no. 4287, J. C. Buff, Balsam," right label "*Hemigymnaspis orchidicola* Davidson and Miller, HOLOTYPE." There are 6 paratypes with the above data on 4 slides; 1 slide is deposited in the BM, the others are in the USNM.

Field characters.—The female cover is elongate oval, flattened, light beige, with the brown exuviae located off center. Most scales were found on the upper surface of the leaf.

Adult Female

(Fig. 5)

Recognition characters.—Holotype adult female 0.6 mm long (paratypes 0.7) 0.5 mm wide (paratype 0.6–0.7 (0.6)); prosomal sclerotization includes about $\frac{1}{3}$ of anterior dorsum.

Prosomal dorsum with small microducts in submedial areas of unsclerotized areas of abdomen, in marginal areas on mesothorax, and near eye; larger microducts in irregular band along body margin from anterior part of pygidium to posterior margin of thorax; large gland spines on margin from pygidium to posterior thorax; small gland spines or gland tubercles on margin of thorax and head, becoming ventral anteriorly; 3 cicatrices and large, protruding eye. Prosomal venter with antenna bearing 4 conspicuous setae; paraspiracular areas weakly sclerotized, forming oval plates slightly longer than length of spiracular diameter; conspicuous clear area posterolaterad of each spiracle; cicatrices absent; microducts of 2 types, ducts on margin forming small gland spines mentioned on prosomal dorsum, ducts on submargin of abdomen and submedian of abdomen and thorax without dermal protrusions.

Pygidium rounded apically. Pygidial dorsum with 5 indefinite sclerotized areas. Macroducts primarily on sclerotized areas, ducts of 2 sizes; posterior ducts largest; pygidium with 26 ducts on 1 side of body and 25 on other (paratypes 23–31 (27)); sclerotized spot near apex of 2nd sclerotized area; anal opening slightly posterior of pygidial midlength. Pygidium with 5 lobes; medial lobe and lobe 2 each with 1 lateral and 1 medial notch, lobes 3–5 wider than long, serrate, with dorsal seta on medial side of each lobe. Plates between medial lobes similar to other plates, 2 between medial lobes, 2 between medial lobes and lobe 2, 3 between lobe 2 and 3, 3 between lobes 3 and 4, and 3 between lobes 4 and 5; plates each with 1 or 2 slender microducts, each duct with normal inner filament; interlobular spaces without small lobules. Pygidial venter with few small microducts; perivulvar pores organized into 2



Fig. 5. *Hemigymnaspis orchidicola*, adult female holotype, dorsal and ventral aspects.

pairs of groups or scattered. Vulva anterior of pygidial midlength. Paraphyses unusually short, usually 2 between each of medial lobes, medial lobes and lobe 2, and lobes 2 and 3.

Variation.—One paratype has the pygidium partially retracted into prosoma; the microtubular ducts are normally less abundant on the dorsum than on the holotype.

Notes.—The above descriptions are based on 7 specimens.

For a comparison of *H. orchidicola* with *H. eugeniae* and *H. pimentae* see "Notes" of the latter 2 species.

Hemigymnaspis pimentae Davidson and Miller, new species

Type-data.—Holotype adult female on slide with 2 other specimens; holotype nearest bottom of slide with left label "Hemigymnaspis pimentae Davidson and Miller, Dominican Republic, ex *Pimenta* sp. leaf, XI-19-75, JFKIA 21574, D. Walters, Balsam," right label with map of position of holotype and "Hemigymnaspis pimentae Davidson and Miller, HOLOTYPE and PARATYPES" (USNM). There are 10 paratypes with the same data on 4 slides; 3 slides are in the USNM; 1 is in the BM.

Field characters.—The female cover is oval, flattened, black with the black exuviae located subcentrally. Most scales were found on the under surface of the leaf.

Adult Female

(Fig. 6)

Recognition characters.—Holotype adult female 0.7 mm long (paratypes 0.5–0.6 (0.6)), 0.5 mm wide (paratypes 0.5–0.6 (0.6)); prosomal sclerotization absent.

Prosomal dorsum with small microducts scattered over submedial areas and near body margin of thorax and head; larger microducts abundant along body margin from pygidium to posterior thorax, same size as small macroducts on pygidium, becoming increasingly smaller anteriorly; 2 or 3 marginal gland spines on posterior abdominal segments; 2 cicatrices and slightly protruding sclerotized eye. Prosomal venter with antenna bearing 2 conspicuous setae; paraspircular areas weakly sclerotized, forming plate slightly longer than length of spiracular diameter; cicatrices absent; microducts of 2 types, ducts scattered over submedial and submarginal areas without dermal modifications, marginal ducts forming gland tubercles.

Pygidium apically rounded. Pygidial dorsum with 4 indefinite sclerotized areas. Macroducts not restricted to sclerotized areas, ducts of 2 sizes, large size near lobes 1 and 2, small size elsewhere, 61 ducts on 1 side of body and 52 on other (paratypes 55–73 (63)); sclerotized spot near apex of 2nd sclerotized area; anal opening well into anterior half of pygidial midlength. Pygidium with 6 lobes; medial lobe and lobe 2 each with 1 lateral and 1 medial notch, lobes 3–5 wider than long, serrate, with dorsal seta at medial side of lobe, lobe 6 represented by 1 or 2 small serrate projections. Plates between medial lobes similar to other plates, 2 between medial lobes, 2 between medial and 2nd lobes, 2 between 2nd and 3rd lobes, 3 between 3rd and 4th lobes, 3 between 4th and 5th lobes, and 2 between 5th and 6th

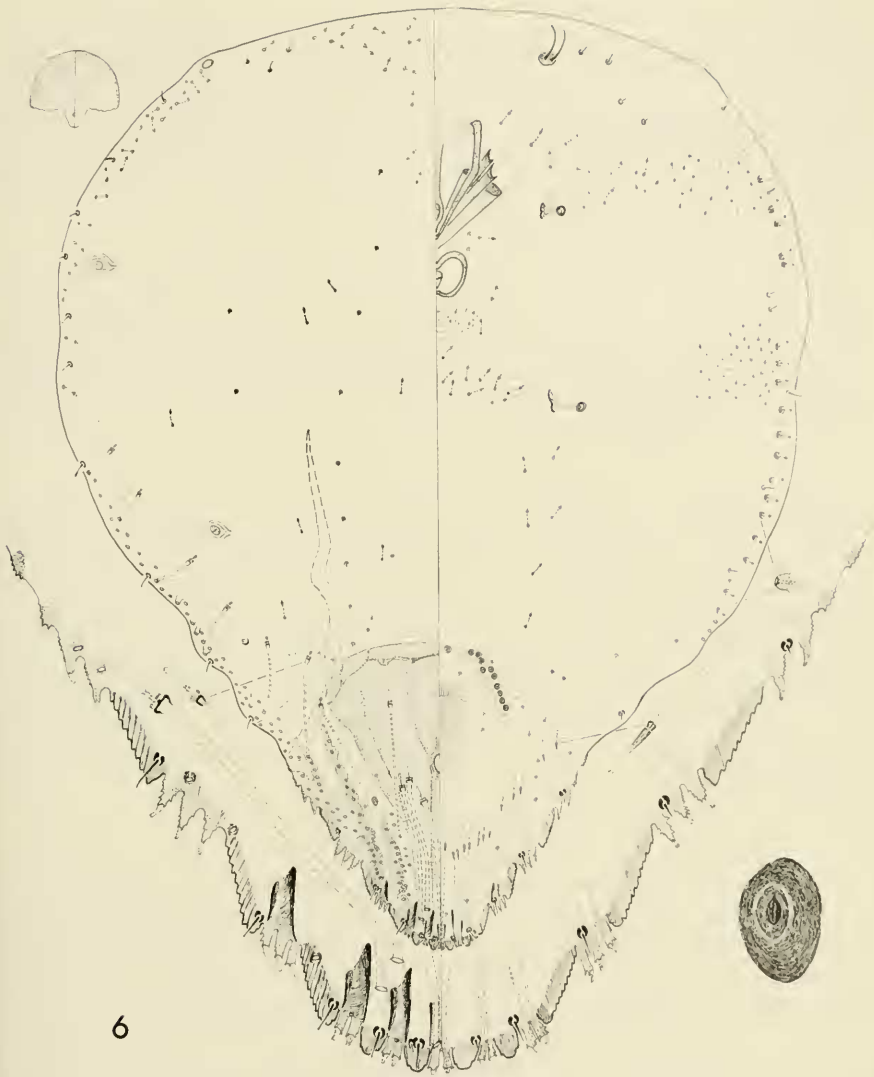


Fig. 6. *Hemigymnaspis pimentae*, adult female holotype, dorsal and ventral aspects.

lobes; plates each with 1 slender microduct, inner filament of normal length; interlobular space without small lobules. Pygidial venter with few small microducts on submargin; perivulvar pores scattered around vulva, not organized into groups. Vulva anterior of pygidial midlength. Paraphyses long, 2 between each of medial lobes, medial lobe and lobe 2, lobes 2 and 3.

Variation.—Most paratypes have the head and anterior thorax heavily sclerotized, and the pygidium partially retracted into prosoma; when the anterior part of the body is sclerotized, the gland tubercles are dorsal. Mature adult females have the sclerotized areas partially or completely fused; paratypes have 2–4 (3) conspicuous setae on each antenna; one specimen lacks the 6th lobe; several specimens have 3 plates between lobes 5 and 6.

Notes.—The above description is based on 7 specimens.

Hemigymnaspis pimentae is similar to *H. eugeniae* and *H. orchidicola*. It differs by having more pygidial macroducts, a dense band of microducts around the anterior margin of the head, and a cluster of microducts anterior of the front spiracle. *Hemigymnaspis eugeniae* and *H. orchidicola* have fewer pygidial macroducts and lack ducts in the areas mentioned above for *H. pimentae*.

Discussion

Hemigymnaspis brayi and *H. jessopae* have features of the interlobular plates which are atypical of other *Hemigymnaspis* species. We have considered placing *H. brayi* and *H. jessopae* in a new genus, but because they have many features typical of *Hemigymnaspis* species, we have decided to place them tentatively in *Hemigymnaspis*. We feel that many additional species will be found when more intensive collecting is done on native vegetation of the Caribbean Islands. When this new material is described, it may be easier to understand the range of characters in *Hemigymnaspis*.

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Footnote

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